

## Warmer or Cooler

**Topic:** Atmosphere

**Objectives:** Compare the temperatures of different surfaces

**Grade Level:** all (early grades will need adult help)

**Time:** 15 – 20 minutes

**Materials:** sunny day, thermometers, styrofoam cups, watches or timers, whistle, writing pads, pens or pencils

Vocabulary:  
radiant  
absorb  
reflect  
thermometer  
bulb

**Location:** student-selected locations around Piedmont Park

**Background:** The sun's radiant energy heats the surface of the earth. But the many different features on the earth's surface absorb or reflect different amounts of sunlight. Surface factors such as texture, color, or shape affect the amount of sunlight a surface absorbs or reflects. The more sunlight a surface absorbs, the warmer that surface becomes. It is uneven heating of the earth's different surface features that creates wind and weather. In this activity you will compare the varying amounts of sunlight absorbed or reflected by different surfaces in Piedmont Park by measuring the temperature of the air above them.

**Advance Preparation:** none

### Procedure:

1. Form a team with one or two of your classmates. Collect for your team a thermometer and a styrofoam cup from your teacher or activity leader.
2. Select an area in the park with a specific textured or colored surface. For example, your team might locate a grassy surface or a dark surface or a surface covered with bare dirt or with concrete.
3. Measure the air temperature above the surface your team has selected. To do this, carefully poke the bulb end of the thermometer through the bottom of the styrofoam cup. Then place the cup, topside down, on the surface. Leave it there for four or five minutes. Record the temperature reading and the surface texture and color. Record whether your surface is in the sun or shade.
4. Repeat this procedure on several other different surfaces.
5. Return to your teacher or activity leader when you hear the whistle.

**Questions to think about and discuss:**

1. Of the surfaces your team and other teams in your class measured, which ones were the warmest? Which were the coolest?
2. Try to generalize from the findings your class made which textures or colors absorb or reflect the most sunlight. Think of some ways that these facts affect our lives. Think about the textures and colors of clothes people wear during different seasons, or where a cat will sleep on a cold day, or what is a good place to keep a chocolate bar from melting on a hot day.
3. How do you suppose your findings might differ if you perform this experiment on another day? What would happen if you tried it on a cloudy day? What if you tried it on a hotter or cooler day?